

OBSERVATIONS

ON

SPASMODIC CHOLERA,

ITS

Origin, Nature, and Treatment;

WITH

REMARKS ON EPIDEMIC DISEASES GENERALLY.

SECOND EDITION,

WITH ADDITIONS AND ALTERATIONS.

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THE first edition of this pamphlet, which was written during the turmoil and hurry of Hospital practice, having been exhausted, I beg to offer this second to the public. The appendix which is now added, contains a minute summary of the mode of treatment pursued in the Belfast Cholera Hospital, whereby the gross mortality has been kept below twenty-five in every hundred cases, an unexampled degree of success I believe, in hospital practice. Some things I intended to have re-written, others, to have modified, but my time was limited, and I thought that I would just leave my general statements, which, so far as I know, are correct, nearly as they were. Speculation besides is endless; I have thought a great deal more on the subject than I have been able to express—and I am not sure that any alterations which I could effect, would be improvements,

OBSERVATIONS

ON

SPASMODIC CHOLERA.

I feel persuaded that epidemic diseases, whether contagious or otherwise, are not the necessary heritage of mankind.— Like other terrestrial phenomena, they have certain causes or precursors. It is frequently a difficult problem to ascertain what these are, although it is a matter of the utmost importance to do so; for without a knowledge of this kind, how can we devise means for arresting the progress or lessening the ravages of epidemics?

The production of pestilence is a result of the operation of one of the various agents, which act upon the organization, and influence the operations of living bodies. It is an enormous evil, no doubt; but it is somewhat consolatory to become acquainted with the manner of its production, and to know that if it arise from some invasion of the physical laws of our nature, so, a better acquaintance with, and closer observance of these laws, will ensure our preservation.

Every disease, without exception, whether epidemic or otherwise, arising from external causes, must take its origin from the operation of some one or other of the phenomena of nature, acting in opposition to the functions of our organization. But the specific manner in which diseases arise, is still far from being accurately known, although there are few subjects of inquiry more worthy of being studied; for until we know this, how are the physical health and well-being of mankind to be effectually promoted? Diseases are mostly intractable enough, and it is infinitely desirable to be acquainted with every means of preventing their inroads.

Most epidemics have had a local origin. Some particular concurrence of circumstances generated the poison to which the first susceptible person exposed was the victim, and he in turn, when the epidemic was contagious, became the origin and the means of its further propagation. This circumstance seems truly strange and mysterious. It would appear to us enough, that those persons only should be affected, who come within the influence of the local

agent. But no—they in their turn become other centres of disease, until at length, nothing hindering, it runs the circuit of all the habitations of mankind. What is the final cause of this? May we not venture to affirm, that since Providence does nothing in vain, there must be a reason for it. Surely there is—and I take it to be this:—If we look around us and reflect, we observe that the most extraordinary care has been taken by Nature to secure the health of our species. Every encouragement is held out to that line of conduct by which it is promoted, while misery and unhappiness are the portion of him who neglects it. Nature protects the healthy, while she cuts off the diseased, and thus averts the degradation of our race. But her ordinary means of doing this are not always sufficient: some circumstance is sure to lead to the production of a pestilence, which stretches forth its ruthless hand, till the law of its existence is accomplished. The healthy and the vigorous do sometimes, it is true, fall victims; but nothing can be better ascertained than that the debilitated and the unsound do for the most part perish alone. If mankind were healthy and vigorous, pestilence would never assail them—it could not do so. It is commonly and truly said, that the pestilence knows its victim—it can have no mission to the healthy. What a lesson to mankind, then, if they will but take it—what an incitement to temperance and sobriety, to procuring the means of health and well-being to ourselves and to others. We may mourn over the melancholy fate of humanity, subject to such a complication of evils, but it is on the whole well. The population of the earth is thus kept young and vigorous; and any evils which we suffer from such a condition of things here, will, I trust, be amply overbalanced hereafter.

Although it is true that pestilence has its march among the broken down, the infirm, and the weak, yet it does not wholly confine itself to these. It happens on occasions, rare indeed, that the young and the robust, from some unknown peculiarity of constitution, come within the sphere of its influence, and are snatched off without much warning. But those who are in easy circumstances, and in the enjoyment of habitual good health, are rendered liable to attacks from another cause—I mean the casual and temporary indisposition brought on by neglect, accident, or compliance with the customs of society. Few indeed are there, who have the knowledge, the resolution, or the means of following the rule of nature in their lives. It will appear from this, that although the worn-out and the intemperate are the most frequent subjects of attack, others who are not so, cannot always escape. The state of our frames, when labouring under temporary ill health, is closely allied to that in which it is

habitual; hence, at such periods, equal liability. The wealthy and the exalted, therefore, do not wholly escape; and their humanity receives an additional impulse from this consideration, to labour in the expulsion of destitution and misery, and consequently of pestilence, from the abodes of mankind.

It is not easy to know what the exact circumstances are, which lead to the development of epidemic diseases, or how they produce them when they do exist. In modern Egypt we see the filthy state of human habitations, and the careless, brutal manner of inhuming the dead; and when we witness a disease of tremendous virulence springing up under such circumstances, we are reasonably entitled to refer this disease, which we call the plague, and which was unknown in ancient times in that country, to this condition of things. In certain districts of America, and in most of the West India islands, at particular times of the year, there is a hot, burning sun, with a rank, moist, and sometimes marshy vegetation. Exhalations are produced, which lead to a disease called the yellow fever, which sometimes, when these causes are peculiarly active, becomes epidemic. Other instances might be mentioned, but these will probably suffice. The Cholera is said to have commenced at Jessore, in the delta of the Ganges; and it is known that there prevails in that district a rank, marshy soil, and an exuberant vegetation under a sultry sun. All the epidemic diseases of which we know the history, have had a similar origin.

The virulence with which an epidemic breaks out, and even its existence, depend upon the general condition of the individuals submitted to the influence of the circumstances already spoken of. If they be well supplied with the necessities of life, and are cleanly in their habits, the pestilence will not break forth. Now this is a most important law; for it seems, I think, to be ascertained beyond the shadow of a doubt, that pestilence will not arise where the people are well off. Sporadic or scattered cases will indeed happen; but they will not spread. Of course I except those places which are unfit for human existence. Hence, it will be seen, in virtue of the preceding, that when a people are subjected to famine, a very slight cause is sufficient to kindle a pestilence: war, famine, and pestilence, are, therefore, seen frequently following in each other's train. War leads to famine, and famine to pestilence, in inevitable succession, as if denouncing each other and the causes which have produced them.

Abundance of speculation has taken place as to the manner in which Cholera arose; but the simplest view of the case seems to be, that the unusually putrid emanations of an unhealthy soil, acting upon the enfeebled organs of a debilitated and impoverished people, of impure habits, in a manner which

we do not minutely understand, produced this disease.—Why it did not take place before, if this be the case, may be replied to by saying, that the particular condition of soil, season, and of bodily deprivation, had not happened before. If it be said to have occurred in more places than one simultaneously, then these causes must have come simultaneously into existence.

We need not seek for the solution of this question in the operation of telluric exhalations, in changes of the electrical condition of the atmosphere or soil, or in some other unknown something. A weakened condition of the organic powers, acted upon by the foul products of a vitiated vegetation, seems the obvious cause; nor does it appear that we shall be able to penetrate much farther. If any one ask me why yellow fever or plague did not spring up at Jessore in place of Cholera, I will reply that I cannot tell. The operations of malific agents are infinitely diversified, and every change in their depressing action, produces a corresponding change of feature, in the incident complaint. Sometimes one organ is attacked more than another, and sometimes several are attacked together; and hence, although they may differ in the details, diseases are necessarily and naturally, so to speak, divided into families, according to the functions or organs which are attacked.

No subject has so frequently and so anxiously been discussed, as whether epidemic diseases in general, and Cholera in particular, be contagious. Men of the highest talents and most extensive experience, both professional and unprofessional, have taken opposite views. A multitude of indirect arguments have been urged on both sides, with more or less weight, and with more or less skill, according to the talents of the disputants. The direct arguments may be reduced, however, to two:—The contagionists affirming that many persons have taken the disease after coming into contact with it, and the anti-contagionists asserting that many are exposed to the disease who do not take it at all. Now, both are correct; but, if the former can be ascertained in a sufficient number of instances, to do away with the mere coincidence, then the contagious nature of Cholera, for I speak of Cholera, is ascertained beyond a doubt. And I believe the evidence in favour of the disease having arisen from intercourse, to be overwhelming. It would take up too much room to consider the collateral evidence in this question, in this place—nor is it necessary; for if it be once established, that in one or more instances, Cholera has resulted from personal communication, then, the question is settled beyond appeal. If the facts stated on this head be correct, there is no possibility of arriving at any other conclusion. And facts of this kind have been transmitted from a variety of quar-

ters, and from individuals of scientific correctness and unimpeachable veracity.* Nor did I myself yield my conviction on the subject, till the number and the urgency of the instances which I witnessed, seemed to leave no room for further hesitation.—There is no lack of negative evidence on the subject, but this at best is of an ambiguous nature; for if there have been individuals who have secluded themselves, and have not taken the disease, so the instances are infinitely more numerous where there was the fullest exposure, without any ill consequences arising. To be sure, when a great number have escaped who were confined together, it seems to exalt

* The earliest case of Cholera in Belfast, was that of a person who had arrived from Glasgow; the particulars which I witnessed myself, are fully stated in the Report of the Board of Health. Instance after instance has occurred to my own knowledge, wherein persons contracted the disease after coming in contact with those who had it. In the numerous list of English and French publications which I have consulted, and to the authors of which, I acknowledge my obligations in general terms, numerous cases of the transmission of the disease from person to person are given. These are too numerous to quote; but I refer the reader to Orton, Hawkins, Kennedy, Hancock, the *Lancet*, the *Edinburgh Medical Journal*, the *Foreign Quarterly*, the *Westminster*, and many others. Mr. Bell, and the conductors of many of our excellent periodicals, question the point of contagion. It is truly remarkable how such a difference of opinion can exist upon this subject.—I have seen many who were attacked, after washing the remains of their friends, or visiting their relatives in the hospitals. The woman who washed the remains of a gentleman in Belfast, (Mr. H., who died of Cholera,) came into the Hospital in collapse, and died. A man came to Belfast from Dromore; while in Belfast, he helped a Cholera patient into the vehicle used to convey the sick to the hospital; he then returned to Dromore, and died within twenty-four hours, of Cholera. His daughter, who attended him in his last moments, contracted Cholera herself, but recovered. These were the first cases in Dromore; the girl had not left home. This was related to me by an eye-witness of the events, a clergyman in Dromore, whose word is perfect authority. The first case in Portaferry was that of a man who came sick from Liverpool, by the steam-boat: he died in Portaferry. After his death, a friend performed some of the last offices to his remains. This friend was servant-man to a gentleman in Portaferry: the gentleman took the disease, but recovered. A most respectable practitioner, who attended the gentleman, related this to me. In the Cholera Hospital of Belfast, all the servants have been ill, some of them for the second or third time. One nurse narrowly escaped dying, as she fell into collapse. The man who drove the Cholera carriage, fell into collapse and died in a few hours: he had not reported his case early.—One of the apothecaries had a smart attack, but recovered. I had the premonitory symptoms, with acute pains in my stomach, and faintishness, which I subdued by the timely use of medicine. In the hospital in Ballymacarrett, (a suburb of Belfast) the first physician appointed took Cholera and died: circumstances prevented me from seeing this unfortunate gentleman, who was of a delicate constitution, and, moreover, did not attend to his case early.—He did not believe in contagion; and, I was told, that when pressed with fatigue, he sometimes slept on beds which had been occupied by patients. Indeed, he had been known to yield his own bed to them. His successor also took ill, and recovered after the most energetic medication. These facts are known to all here, and they are only a part of those which have come to my knowledge.—The season is calm and beautiful, and the air pure: how can we suppose that any possible variation now existing in it, could, in this country produce such an epidemic? If it were so, why are not people attacked in the country—why are the attacks not simultaneous? Paris, where the disease broke out so rapidly, is a consummation of filth; and the people have incessant intercourse in their theatres, *cafés*, gardens, *lieux publics*, &c. I am of opinion that no case of Cholera has occurred in Europe, and I may now add America, which was not the exclusive result of contagion.

the efficacy of seclusion ; but then, individuals who can afford to practice this voluntarily, have been generally in easy circumstances ; while, on the other hand, Cholera has found its way to the predisposed, through the bolts and bars of the prison-door.

The question of contagion is indeed of vast importance, as it is one in which the hopes and fears, and frequently the interests of mankind, are largely concerned ;—and it is precisely on this account, that the question has assumed such an unintelligible, complex aspect. The minds of many are warped so as to give a readier accordance, to what it seems their immediate interest to believe ; but it may be safely asserted, that it must be most for our interests, in the long run, to believe what is true, whether Cholera be contagious or the contrary ; for if an erroneous belief be adhered to, evil must somewhere or other surely result from it. This question, then, should be discussed in a calm, dispassionate manner. It has been the habit for some of the disputants to prejudge the case, by alleging the evil consequences of a particular conclusion ; but surely the point at issue should be first established, if possible, before we begin to draw conclusions on either side. The advocates for non-contagion have said, it will go to destroy commerce, and tear up the better feelings which bind families and individuals together, by the roots, if you assert the disease to be contagious ; while adherents of contagion say, by urging the non-infectious nature of this formidable disease, you pave the way for the reception of the relentless demon of pestilence, which, propagated from person to person, in consequence of the undoing of all precaution, will finally lead to the most destructive consequences. It could be very easily shown, how erroneous such a mixed mode of reasoning is ; but it will be better to proceed at once to a statement of the actual nature of the disease in this respect, so far as it has been ascertained, and then to draw any consequences which may be legitimately deducible.

I take up the position then, that Cholera is conditionally contagious or infectious, for these terms have now a common acceptance. It is a disease which is contagious, but limited in this respect by certain conditions, to which it is, in common with all pestilential diseases, subjected. What are these conditions ?—why, susceptibility is one of them. It is the first grand feature in the march of these diseases, that they do not attack mankind indiscriminately. Those in whom, all things considered, the principle of life is in energetic action, are little, if at all susceptible of their influence ; while, on the other hand, they in whom this principle is permanently or temporarily weakened, are more or less susceptible, according to the nature and extent of the deterioration. This

principle is one which cannot be too conspicuously displayed ; it explains at once, why the poor and wretched are the constant victims of pestilence in all times and countries, and why the alert and vigorous escape ; and it does away with the apparent anomaly of the same disease appearing contagious at one time and not so at another.

The great majority of those who have been attacked with Cholera, have been the dissipated and the enfeebled, or those labouring under temporary sources of debility. In one class the powers of life have been weakened by incessant overstimulation, and in the other, by the equally incessant application of debilitating agents, such as bad or insufficient food and clothing, over-exertion, intemperate exposure to the weather, and depressing passions. In these last, the capabilities of the corporeal machine have never been duly developed or sustained—in the former, the springs of existence have been kept incessantly on the stretch, so that, in either case, the least additional strain snaps the bond for ever asunder. The fewer the debilitating agents are, the more easily will any single one be borne in proportion to its intensity ; thus a person who is well clothed and lodged, and not exposed to fatigue, will bear a greater degree of privation in the article of food, than one who endures them all. And, on the other hand, a hard drinker, if he will use air and exercise, so as to create an appetite for solid food, will be able to indulge in much greater excesses than those in whom the digestive powers are enfeebled. And this holds true with regard to all the sustaining and debilitating agents which hold sway over our mortal existence. How true is it, for example, that a cheerful person will remain in better health under the use of inferior sustenance, than another who is not so : so true indeed is this, that popular sayings record the fact in every language. The happy medium lies in avoiding either extreme of too great excess, or of self-denial ; though it must be confessed, that in those who have the means, excess is in general more prevalent than its opposite.

Much depends upon habit and mode of life, and much upon the original or the acquired constitution of the individual exposed to disease. Infancy and old age are, other causes alike, more subject than those of intermediate years. Many persons have sufficient habitual stamina of constitution to resist disease, but whose powers of repelling it fail them, when subjected to the temporary influence of debilitating causes. The vigorous, or those seemingly so, are not always exempt during the invasion of epidemics ; but such cases are rare, and probably arise from temporary debility. The weakening influence of fatigue, low diet, moisture, cold, and depressing passions, is well known ; but that of fear is not so obvious, because not so manifest. I look upon fear as a most powerful source of disease ; for by the minute sympathy which

exists between mind and body, the powers of the latter in warding off disease, are vehemently enfeebled or reduced by it. Hence it often is, that the strong in constitution may be reduced below the weak, and disease and death ensue, to which they would not otherwise have been subject. But if fear be debilitating, so, on the other hand, courage is invigorating; and all things else alike, the strongly-minded man or woman will resist disease and death, where others would surely perish. Fortitude alone will bring us through an infinity of perils, which we have no other means of averting. Even ordinary men, when forced by circumstances to act with vigour and resolution, will preserve their health and strength, when those around them, not impelled by the same causes, perish.* And even death itself, when it becomes inevitable, produces but little terror when it occasions any, in the courageous and evenly-balanced mind.

There is another agent, which, as it possesses a good deal of influence over the progress of epidemic disease, must not be overlooked—I mean habit. Custom blunts the impression of morbid agents on our organs. They who have recovered from one attack, rarely experience another; and those whose frames have been gradually familiarized to the contact of these agents, will frequently, it appears, escape an attack, which they would not have done if they had been subjected to their full influence at once. Habit, also, commonly lessens the sense of danger, and thereby does away with the injurious interference which fear invariably exercises with the bodily functions.

The best means of preservation will lie in cheerfulness of mind, and bodily temperance and regularity; in the avoidance of all extremes, and in the ready performance of any duty which may devolve upon us. We are not required to rush needlessly into the way of danger, or to run away from it:—excess of caution is about as hurtful as excessive rashness; and it has not been found, generally speaking, that those who devoted themselves to the care of the sick, have suffered more than others who confined themselves to the interior of their dwellings, and whose imaginary security is hardly purchased by the sacrifice of the rich and glowing feelings which the exercise of philanthropy affords.

There has been a world of discussion about the mode in which the contagion of Cholera spreads. This has been the case during every epidemic disease. The manner of contagion or infection may be said to be twofold—mediate and immediate, or direct and indirect. It is said to be immediate or direct, when the disease is communicated by the body of

* Captain Beaver, a man of no common understanding however, I firmly believe preserved his life through his energy and fortitude, when most of his followers died, during an attempt to form a settlement on the coast of Africa.

the sufferer, or the objects immediately surrounding him; and mediate or indirect when the virus is transmitted to a distance through the atmosphere, or by means of clothes, furniture, goods,—or is left adhering to apartments or utensils. We presume that it is contagious, in the first place, when we witness a succession of individuals contracting the disease after coming in contact with the sick or their remains; and we likewise infer that it is transmissible to a distance, when sickness ensues upon making use of an article which has been in contact with one who has had the disease. The first cases in any town are generally referrible to direct contagion; but afterwards, when the disease spreads, the progress of contagion cannot be traced in the transmission of gross material substances: hence our remaining conclusion is, that the virus is wafted through the atmosphere, and lights upon the debilitated and predisposed. We have direct evidence of the certainty of this. Of a number of ships which entered the Hoogly together, and lay at anchor off Calcutta, it was observed that the crews of those vessels which lay to leeward of those in the river which had Cholera on board, took the disease also. A similar fact has been observed in India, in overland expeditions, when troops marching to leeward of an infected city, were observed then and there to contract the disease. Another case, precisely in point, is stated to have occurred in the Medway, by the quarantine officer stationed there. Now if the epidemic virus be diffused in one place, this may be inferred to be the case in all; so that, in every town where the disease is general, the poison may be concluded to have vitiated the atmosphere to a greater or less extent. Further collateral evidence is afforded of the truth of this proposition, by the fact, that it often happens, as at Moscow, for example, during the prevalence of Cholera, that derangement of the digestive organs becomes very general in persons whose vigour of constitution is too powerful for the virus to affect it, or on whom it is too weak to produce any serious effect. By some, however, this very fact is quoted as a proof that the disease arises from local non-imported causes, as in the first instance; but if the evidence for contagion be considered satisfactory, is it not much more reasonable to refer the extension of Cholera to the latter, than to the simultaneous or successive generation of a tissue of circumstances capable of re-producing it, as in the first instance at Jessore, over such a variety of soil, climate, and season? Even granting that Jessore was not the first place in India, nor the only one at a given time where the disease was brought forth, it will not invalidate the position already set out with; and in arguing upon the ratios of probabilities, surely it is most reasonable and most philosophical to adopt the simplest and most obvious method of doing so.—

The simultaneous or successive production of Cholera by local causes, involves us in an immense chaos of contradictions and assumptions, which can only be got over by admitting the truth of the doctrine of contagion. It is possible, indeed, that this simultaneous production might take place; but is it probable? Surely, if we looked for it, it would be in its native soil—in the moist and sultry alluvions of the East, where indeed, it is more than probable that Jessore was not the only nor the first locality of its birth.

Some considering that the effluvia from the bodies of the sick, in places distant from the native origin of the disease, was not sufficient to affect the atmosphere, have had recourse to the supposition of a kind of fermentation, by which its powers were increased in quantity and virulence. But there is not a shadow of evidence for any such process, and it is highly unphilosophical to assume its existence otherwise.

People talk of the forerunners of pestilence, about green flies,—dry seasons, and wet ones,—plentiful years and years of scarcity; but the fact is, that apart from the question of its origin, the disease has spread in all climates, and under every possible variety of season and soil; and that what have been called forerunners are nothing more or less than accidental occurrences. But this, however, is not meant to interfere with the probability that the disease may be hurried or retarded, according to the circumstances of the country into which it makes its inroads. So true is this, that I firmly believe, from sickening mortality to absolute security rests in the nature of the soil and climate, and the condition of the inhabitants of a threatened territory, but principally upon this last circumstance. No country seems yet to be perfectly free from the possibility of an inroad, because none are sufficiently far advanced in civilization, and in the possession of comforts and moral intelligence; but that the world will yet be so, I cannot doubt: the difference between the violence of the attack in different places, shows the influence of these circumstances in modifying it already.

Fortunately for mankind, that Power which regulates and tempers all things, has also placed a limit to the invasion of pestilence. By the law of its existence and progress, it can continue in no one place for an unlimited time. The attack in its onset is generally most violent, because then the weakest and most susceptible individuals are seized; as the number of these gradually diminish, so the disease decreases in force and violence, until it finally ceases and dies away for want of prey. Were this not so, mankind would be speedily destroyed, as with every attack, fresh stores would be added to the accumulation of the poison; but, as I have elsewhere ventured to assert, the final purpose of the pestilence is to

bring mankind to a right mode of living, and by cutting off the intemperate and debilitated, to maintain the race in ability and vigour; so, having accomplished its purpose, it necessarily ceases. Let us not repine. We are subject to no evil unless to prevent a greater one; without these modes of rectifying the consequences of our errors and our ignorance, our race would decline, until, at length, ceasing to wear the aspect of humanity, it would perish from its inability to maintain itself in existence.

It is a question of deep moment, how far the utility of quarantine extends. That it has proved useful in some cases, cannot be doubted; but it seems to have signally failed on a large scale. Russia could not escape by means of it; Prussia was invaded, notwithstanding a triple cordon of bayonets; and the quarantine system has been in full force on our own coasts, without effecting its object. It would seem impossible to cut off all intercourse between adjoining countries, having a wide frontier; innumerable cases of communication will ensue, by any one of which the disease may be propagated, notwithstanding the most rigid interception of intercourse which it is possible to effect; and how is it possible, besides, to set limits to a pestilence which infects the air? It would seem that the utility of quarantine is confined to the interception of actual cases of disease, and the purification of articles, by heat or otherwise, which may have served as vehicles for the contagious virus. Further delay than what this may require, seems only calculated to impose injurious restrictions on commercial and general intercourse.

It is still a subject of inquiry, what the best means are, of destroying the latent poison, and of preventing its accumulation. I would, without further preliminary, place rigid cleanliness the first on the list; and secondly, the removal of all unnecessary moisture. Suspected substances should be heated to 212° , when this can be done without injury; wearing apparel and bed-clothes, if heated in a Papin's digester, or steeped in a solution of chlorine, will be effectually purified; or if circumstances should render this inconvenient, they may be burnt. Uncleanliness is a most pestilent vice, and not less productive of moral than physical impurity, and the powerful promoter of all kinds of diseases, but especially of epidemic ones. The observance of cleanliness is one of the most important means of preserving health; and the strictest attention to it, in every operation about the sick, cannot be too carefully enforced.

The formidable disease, which generally receives the name of Cholera Morbus, has been about fourteen years in reaching us, but seems to have lost none of its characteristics in the transit; if there be any difference, it consists in being more

vehement in the individuals who are attacked, but less general in its assaults. The susceptible subjects seem to be fewer in most parts of Europe than in the East; but without entering into the question of the reason of this, I shall briefly describe the complaint itself.—The person affected may feel a general uneasiness for some days, or the disease may come on all at once, which it does with sickness at the stomach, and a sudden discharge of a serous fluid from the stomach and intestines, without much pain, but attended with a feeling of weakness and sickening emptiness. This continues for some time, with more or less violence; the weakness increases; cramps ensue; the pulse becomes faint, and then finally ceases. The extremities now become chill; the animal heat decreases; the skin shrinks in, and the tongue grows moist and ice-cold. The limbs now assume a blue, and sometimes a leaden hue; the flesh seems to retreat; the contour of the figure loses its fulness; the fingers bend in like the claws of a bird; the lips retract, and show the teeth; the features collapse; the eyes sink in the socket, assume a peculiar indefinable expression of anguish and feebleness, and are surrounded with a livid ring; the voice becomes low and stridulous; and a cold clammy sweat bedews the face and extremities. The heart's action is now faint and feeble; the respirations become slower and more laboured; and the mind, which was hitherto cognizant of the external world, almost ceases to receive impressions from without. Kind Providence seems willing that the final scene should close in silence and in peace. For sometime after this period, the breathings become more and more enfeebled; the heart struggles in vain with the load which oppresses it, until, at length, without a sigh or a groan, the weary inmate of the shattered tenement flies its home for ever.

I need not say that the preceding description is not sufficiently full, as to minor particulars. The disease may be days in running its course, or it may be a few hours; occasionally the watery dejections are absent, but there is generally great precordial oppression. The discharges cease first, and then the cramps, before death ensues. All the secretions are interrupted. If nature or medical aid stop the disease, it may never proceed beyond the outset, or may cease at any after period; but recovery seldom takes place after the collapse or full blue stage sets in. Recovery is evinced by the cessation of the symptoms just described, and the revival of the ordinary functions; the respiration becomes free; the pulse begins to beat; a warm perspiration breaks out, the secretions recommence, and the patient finds himself in a state of comparative ease and comfort; so much so, that one could hardly think that he had been the recent subject of such a tremendous visitation. Recovery, however, when it ensues,

is not always thus rapid ; a secondary fever, of a severe stamp, will sometimes set in. This fever not unfrequently proves fatal to those who have escaped the first attack. But the disease will now be more fully elucidated by an analysis of its nature and constitution.

I must premise, by stating that Cholera is essentially a disease of function, any organic change that may ensue, is the result—the consequence, but not the cause of the disease. The poisonous agency which produces Cholera, acts by destroying or diminishing the action of one of the three grand divisions of that nervous system, by whose powers the human frame is maintained in life and vigour. These three are, the respiratory, the cerebral, and the sympathetic ; and it is by the lesion or injury of the last, that we suppose Cholera Morbus to be produced. The breathing continues, as the nerves upon which this function depends remain intact ; the senses and the voluntary muscular powers continue whole, as the brain and its dependencies are unaffected ; but as the motion of the heart, and the integrity of the secretions, depend upon the sympathetic nerve, its ganglions and plexusses, so the loss of power in the latter, also diminishes, or entirely interrupts these functions. Hence the motion of the heart, and consequently the circulation of the blood, and the production of animal heat, are impaired ; the renal, hepatic, and other secretions cease ; and as the integrity of the whole nervous system depends upon that of its parts, so the lesion of the latter causes that of the former, until, if it continues long enough, death itself must ensue, from the want of harmony in the system. Hence it will appear, why the renewal of the secretions is justly considered a favourable sign. As the mouths of the excreting vessels, or in other words, the extremities of the arteries terminating upon the inner surface of the intestines, lose their tone, immense quantities of fluid are thrown out, and the blood is, as it were, drained of its fluid part, or serum. So when we take away blood in Cholera, it is thick and tenacious, as well as dark coloured, there being no arterialization, or conversion of the dark venous, into red arterial blood in the lungs.—Such, in brief terms, is the nature of this disease, which has committed such extensive ravages, and consigned so many millions of our race to the dust—ravages which no pen could chronicle, heart sympathize with, nor intellect fully conceive.

I have said before, that we did not know the exact nature and operation of the poison which produces Cholera. That it was not communicated by contagion in the first instance, is quite self-evident, and equally true of all contagious diseases ; but is it not most wonderful how it is, that the human frame possesses the power of generating a continuation of that poison, capable of producing the same effects : this is among the hidden mysteries of our nature, which human

sagacity is not yet competent to lay open. We know, however, by experience, that under certain conditions of soil and climate, this poison is produced, and that the formidable disease called Spasmodic Cholera results to those predisposed persons who are exposed to its influence. The question of predisposition has been discussed before. We know that any thing which weakens the frame generally, also weakens the sympathetic system of nerves, and so increases the liability to the disease. Hence the dangerous influence of starvation, deficient clothing, organic lesions, corporeal exhaustion, and depressing passions. But there are other evil agents at work besides these; agents that do not act by supplying an insufficient nutriment, but by overstimulating and consequently weakening the frame. I allude to the use of alcoholic drinks, which appear to prove in large quantities a direct poison to the sympathetic nerves, and the functions which they watch over; and doubtless the excess of drink, next to starvation or the direct absence of nutriment, has paved the way more effectually for the ravages of Cholera than any other cause. This is, however, but one out of the multiplicity of evils which intemperance, fit offspring of human ignorance, has led to.

The preceding outlines of the complaint will have afforded an easy transition to the mode of treatment. It consists in increasing the power of the stricken system of nerves; in remedying the results of its inefficiency, and in lessening and rendering light and easy the burthen of its functions.

There is perhaps no stimulant, real or supposed, in the catalogue of medicine, which has not been tried; but my business is not with the doubtful, but the efficient remedies. The means of prevention, both general and personal, have been already touched upon; what has been said on this subject, therefore, need not be repeated. We are not acquainted with any direct and certain means of acting on the sympathetic nerves, independently of the rest of the nervous system, and as this disadvantage cannot be avoided, it must be submitted to.

Of all the remedies made use of, calomel and opium claim the highest rank; blood-letting, heat and frictions come next; then alcoholic drinks, aromatics, and a whole host of minor stimuli. Among the latter may be mentioned electricity; camphor; oxygen; protoxide of nitrogen or nitrous oxide; ammonia; capsicum; the essential oils; phosphorus; and an array of others, which I deem it unnecessary to enumerate.

The treatment varies with the condition of the patient and the stage of the disease. It is of infinite importance to secure medical aid as early as possible; for although, in many cases, medicine proves of no avail, yet, there are few or no diseases in which its powers are so conspicuous when it is timely resorted to. In this disease it may be truly said, that

the physician holds the fiat of life and death in his hands. If, however, it be permitted to proceed without interruption, the different stages follow so close upon one another, that all interference will frequently prove too late. Sometimes it will run through its phases in a few short hours, and at others it will kill at once, of which last, many frightful instances have occurred in the East. My own treatment has been, guided of course by all the information which I could gain on the subject, to bleed the patient, when the state of the circulation would permit it, taking away from ten to twenty ounces. Heat is induced at the same time over the surface by the warm air bath and spirituous frictions. The air-bath affords the quickest and least distressing mode of obtaining heat. I then administer, when necessary, to an adult, from ten to twenty grains of calomel, combined with one or two grains of opium in powder, and washed down with a mixture of laudanum and some diluted spirits and water. This is repeated after one or two hours, according to the urgency of the symptoms, paying less regard to the quantity given, than to the effect produced. If thrown off, it must be repeated as soon as possible. I have thus given in some cases, large quantities of these medicines in a few hours, and with the happiest results. In others, one or two exhibitions will serve to check the complaint. Much, however, will depend upon the mental resources and presence of mind of the practitioner, in the trying emergencies in which he will be sure to find himself, while conducting the treatment of this most dreadful malady. Urgent as the symptoms are, a certain period must be allowed to take place, in order to ascertain the effect of the remedies. The smaller the variety which he administers, consistent with the end in view, the better will it be for the patient. There is, however, a great temptation to heap remedy upon remedy; but we must look to the remaining powers, and not tax them too far, lest we do harm rather than good. There will be enough to employ us in a small way, such as the keeping up of the temperature, the administration of frictions with warm flannel and spirituous liniments—and, above all, the urging of every topic of consolation and encouragement that circumstances will suggest.

If the disease persists, we must continue to exhibit the calomel and opium, at intervals, with cordial drinks, mustard sinapisms to the stomach, and frequent frictions. If we meet with it in an advanced stage, or if it proceed to it, our treatment is the same—stimuli and excitement in every available form; the natural powers of life are fading fast away, and we must try all we can to awaken their dying energy. If the surface grows colder and colder—if chill, dank sweats gush out over the surface—if the skin turns blue and dark—if the cramps

become urgent, the respiration laboured, and the action of the heart faint and low, we must redouble our exertions; now the struggle between life and death has begun, and the question must soon be decided, whether the pestilence will conquer or be conquered. Not a moment is to be lost; we must try to excite a blister on the stomach, by means of turpentine and the Spanish fly; and administer warm and frequent frictions, heat, and repeated doses of brandy and spiced cordials. Sometimes the enemy will relax his grasp in the moment of seeming victory, when all earthly effort seems vain, and when it would appear that death had imposed his chill and relentless mandate. Several such instances have presented themselves to me. We must, therefore, never refrain from our efforts to save, while life remains. It is too true, however, that these last changes, for the most part, are the certain presages of inevitable death, for few, indeed, recover when the collapse, as it is called, has once set in. But, as I have said, we should not relax. Emetics of mustard and warm water have proved useful in this stage, by renewing the lost action of the heart; possibly galvanism might answer, but I have not yet tried it.* I have employed both phosphorus and the nitrous oxide in vain; the patient was able to say that the latter was pleasant, but it did not avert his fate. When the disease, however, has been attacked early—when we have been able to bleed copiously, and the calomel and opium have had time to act, a gentle, warm perspiration will bedew the surface, and the altered language, tone, and looks of the sick, amply proclaim the change. In such cases, and when the vital powers are not broken down by intemperance or debility, or depressed by organic lesions, I believe that the disease is curable in the great majority of cases, and much less mortal than fever. The subsequent exhaustion sometimes proves troublesome, and in cases of great preceding debility, fatal; the patient, therefore, ought to be carefully watched until quite recovered. The sufferers are most urgent for cold drink; water is often preferred to any thing else; but as they generally throw it off, I prefer giving them, when they will take it, rice, bread, or barley water, slightly heated—sour or sweet milk and water, or water acidulated with the vegetable or mineral acids—nitric acid being, however, preferred among the last; also, wine or spirits and water, according to circumstances.

It is almost incredible how quickly some will get round by timely treatment. A child was brought in, in its mother's arms, cold and faint; its eyes were sunk in the sockets, and its face had an expression at which it was painful to look. It received a few tea-spoonfuls of a mixture of laudanum, spirits, and aromatics, diluted, and was well rubbed before a fire. An hour had hardly elapsed, when its little cheeks were plumped up—

* It has been tried in Paris, however, and without success.

its eyes grew bright, while it was kicking about its legs, smiling at its own activity. There were cases not less well marked in adults, and equally decisive of the utility of early treatment; while in others of all ages and both sexes, a few hours too late has rendered assistance useless. Some were attacked in the morning, and were dead at noon, who had been brought to the hospital after the collapse had set in.

I would say that the treatment which I have just detailed, and which is essentially the same as that practised in India, is the best which has been made use of; and that, in ordinary cases, if used sufficiently early, it will procure the recovery of nine cases out of ten. The early exhibition of emetics are praised by many; but finding the calomel and opium perfectly efficient, I could not wish to resort to any other remedies. There is a mode of treatment, called saline, consisting of the administration of a solution of the chlorate of potash, carbonate of soda, and common salt. I tried it twice, fruitlessly, during the stage of collapse; and would not consider myself justified in setting powerful and tried medicines aside for its use. The injection of water, heated to 110° , into the veins, with a little salt and carbonate of soda, has been highly spoken of as having been useful in some cases, during the collapse. I tried it to a slight extent in three cases, two of them fatal ones, without having reason to think that it influenced the results. A more extensive trial would be necessary before I could pronounce; but, as the blood seems to be drained of its serum, it seems *à priori* possible, that such a mode of treatment might prove useful, by diluting the thick and clammy blood—respectable authorities are quoted in favour of the practice.

The fate of some of my patients was certainly hastened by their unconditional refusal to take medicine, being under an impression that it was poison. The most incredible and revolting stories have been circulated and believed by the populace, as to the intentions of medical men, who were instructed, as they say, to poison as many as possible, at a certain sum per head. The more intelligent, however, scout this view; and as the people see individuals among them dying without medical treatment, and the numbers daily increasing of those who owe their lives to it, this belief soon dies away. Outrages, however, of a frightful nature, have been perpetrated under colour of this feeling, which afford a melancholy proof of the sad ignorance of much of the working population of Europe—whatever may be the increasing enlightenment of the times, they certainly do not fully share in it.

The nervous lesion which produces Cholera, is not in general tangible after death. The viscera are found gorged with blood, the bowels are empty, and the gall-bladder full; not unfrequently, there is an effusion of blood on the brain or

spinal marrow. The redundancy of blood in the viscera is such, as to have erroneously given occasional rise to the belief that inflammation was a source or product of the disease ; and the celebrated Broussais resolves the whole of it into a mere form of his famous gastro-enterite. But, to be short, every thing denotes the stasis of the circulation, the remora and inspissation of the blood in the venous system, from the causes already mentioned.

The continuance of muscular irritability, sometimes, but rarely, produces galvanic contortions in the limbs after death. The fetor at the same period is particularly distressing ; and from this and moral reasons, such as the depressing influence of the presence of the remains of the dead under such circumstances, it is desirable to wrap them up quickly, in a tarred cloth, without washing the body, and bury them in a deep grave soon after.

Any unusual display of funeral or quarantine apparatus, strewing of lime, ringing of bells, and the like, prove hurtful, by depressing the minds of the public, which should be encouraged to bear up against the dread of the epidemic, by the hope of its speedy cessation, if they will resolutely employ against it the means which have been already recommended ; but above the rest, temperance in all things, fortitude, and cleanliness.

Having thus brought my remarks on this most striking visitation to a close, I shall conclude my observations with a few short inferences.

Pestilence is a trite word ; but the knowledge of its cause, prevention, and cure, is neither common nor trite. It has hitherto been ushered into all countries, and at all times, with horror and dismay ; and moralists and philosophers, so far from aiding us in this necessary inquiry, too often add, by their querulous accents and powerful description of its ravages, to the general terror. But it is now high time to awaken from this dream of sorrow. Pestilence has causes, and by the removal of these causes, we may avoid the evil. It is one of the instruments which the Deity employs for human improvement ; for when mankind shall inquire into its causes and eradicate them, human happiness will be vastly increased. Now, what are these causes, but ignorance, poverty, and war ; and must not the removal of these effect an enormous advance in human well-being ?— This pestilence is now coursing over the earth's surface ; it is every where snatching the poor and the destitute from their misery ; while it cuts off the intemperate with a ruthless hand. The high in station have been so frequently attacked by it, as to show that no condition is perfectly secure. And as those evils which the rich and powerful share in common with the poor, are promptly attended to, so the

invasion of Cholera has caused a universal attention to their situation and the means of bettering it. Food and clothing have been provided so abundantly, that in many places the pressure of Cholera has added little or nothing to the ordinary mortality. In the unhappy East, however, it has been far otherwise ; the people there are sunk so low from various causes, that human life has been swallowed up by it with frightful rapacity.

The pestilence is now among us ; but, with courage and resolution, we may hope, under God, to allay and finally to put a period to its ravages. What is required under existing circumstances, has been already pointed out—but let us never forget, that the extinction of all pestilence depends upon the general advance of human knowledge, and consequently of human comfort and happiness.

APPENDIX.

THE experience furnished by upwards of 726 cases, has confirmed me in a mode of treatment by which the mortality in that number has not amounted to more than 173 deaths. Of these, more than one-half may be fairly attributed to the patient having been brought in, in the last stage of collapse. Very many of them were those of persons who had been exhausted by long-continued excesses, bad food, over-fatigue, and the debility engendered by various forms of disease.—Others, again, were those of infants, very aged persons, or child-bearing women, of which last, only two escaped with their lives, after undergoing the pains of miscarriage.

As the directions contained in the body of the pamphlet may not appear sufficiently specific, I shall enlarge on them, with such additions as my increased experience may render desirable.

In the great majority of instances, Cholera commences with purging—first, the fæcal matters contained in the intestinal canal are quickly discharged—then, a clear, yellowish fluid, interspersed with flocculi, resembling pale whey, or rice water, is profusely passed afterwards. Vomiting will begin along with the purging or subsequently—first, the contents of the stomach are cast off, and then, a fluid precisely the same as that discharged from the intestines, comes away afterwards. In a few rare cases, either vomiting or purging, or both, will be absent; in this case, there will be great sickness, precordial oppression, cramps, and if the disease be not arrested, collapse and death. The cramps generally come on when the vomiting and purging have existed for some time—frequently, they commence all three together. After a time, the purging and vomiting will cease, whether medicine be given or not; the system becoming exhausted, and the blood being drained of its serum; the cramps also cease in the same manner. Shortly after these disappear spontaneously—the blood ceases to circulate on the surface and in the extremities—cold sweats bedew the skin—a mortal coldness invades the frame, and death soon closes the scene. This is the common, but not the universal order in which the symptoms proceed.

It is of the utmost importance to arrest the purging and vomiting with the least delay; for the fluid discharges are the serum of the blood, and cause weakness and death, as if the blood itself were drawn away. I have often seen a patient pass, in a very short time, a gallon or more of this fluid, which, not long before, was circulating as part of the living blood. This discharge will not cease of itself; it continues till it brings the patient to the verge of death. It is almost the same, as if so much blood streamed from open wounds. I never knew a case in which an individual attacked with Cholera Morbus, grew spontaneously well—the diarrhœa always appears to go on to the produc-

tion of collapse and death, unless medical aid be interposed. The reader will then see the necessity of losing no time; and he will not, therefore, wonder when I tell him, that I do not wait till the discharges and the cramps have made the patient cold and blue, but commence without the loss of a moment, to give the most powerful medicines. These medicines, powerful as they are, cannot be productive of the least injury; but neglected or inefficiently treated Cholera, surely leads to death. The following is the mode of treatment which I follow, specifically laid down:—

If a person between ten and sixty, whether male or female, not much broken down or previously debilitated, be seized with the disease, whether with purging and vomiting, or purging, vomiting, and cramps, I immediately take away from the arm, if the pulse be not weak and thready, from ten to thirty ounces of blood, the quantity being regulated by the strength of the individual and the effects produced. To a man or strong woman, I give, while the arm is tying up, a scruple of calomel, with two grains of opium, both in powder, and washed down with a mixture of some diluted ardent spirits, as gin, whiskey, or brandy, united with from forty to sixty drops of laudanum. To an ordinary woman or weak man, I administer half this dose; to a child the quarter, and to an infant the eighth part. If the medicine be thrown off, in whole or in part, the whole or a part of the same dose, as it may appear, must be immediately repeated. In two or four hours, or every four hours, the medicine must be repeated, if the symptoms are not subdued. In this case, general directions alone can be given: the whole dose may be given again, the half only, or the fourth part, according to the urgency of the disease; in general, however, I find five grains of calomel, and one grain of opium, sufficient. In this, as in many other particulars, the practitioner must use his own discretion. If the complaint be early treated, it will generally be checked after the first or second dose—very frequently a single dose extinguishes it at once. Time after time, patients have been brought in with almost incessant purging, vomiting, and cramps; yet hardly have they been bled and swallowed their medicine, when all these symptoms have vanished, sleep came on, and the patients have awakened after some hours, weak but well. In most instances, however, the medicines require to be repeated. Sometimes the symptoms will continue in a much diminished form; at others, the disease will make efforts to reappear, after the stimulus has been exhausted. In both cases, the repetition of the medicine will produce the desired results.

In some very weak, aged, or broken down persons, the system has rallied for a moment, and then sunk; in this last case, medicine ceases to be of use—nature is exhausted—the leverage of life is broken. We must never, however, presume this to be the case, beforehand, but continue our efforts, till death itself bids us cease. Some constitutions appear so irritable, that the vomiting will continue for days with intermissions, causing much annoyance to the poor patient. In these cases, I find mustard sinapisms, blisters, and occasional warm baths when necessary; opium in some form, a little wine negus at intervals, with some soup or tea, having bread sopped in it, sufficient for its suppression. Some patients complain much of a difficulty in making water. These will require, in many cases, the use of the catheter, abdominal frictions, stupes and warm baths: mild opiates will generally be necessary in addition. With these remedies, this

troublesome affection commonly ceases in a few days. Sometimes the mercury will affect the mouth. In this case, port-wine gargles, the warm bath, careful nourishment, and opiates, will soon cause this symptom to disappear. Every patient has invariably recovered, whose mouth has been affected; and although I never try to produce this result of mercury, as some practitioners recommend, I do not find the recovery in the least retarded by it. Such a trifling and occasional inconvenience in the employment of so admirable a remedy, when the result is the salvation of human life, and a complete victory over a formidable and malignant disease, is not to be regarded for a moment. The patients will sometimes be troubled with griping pains in the stomach and intestines, during their convalescence; but wine and opium, and now and then a warm bath, quickly disperse them. If the bowels should prove costive, from ten to thirty grains of the compound powder of jalap may be given, or from half an ounce to an ounce of castor oil, with an ounce of peppermint-water and twenty drops of laudanum. Sometimes I make the attendants administer a simple enema or injection of gruel with or without castor oil; for I have more than once seen the use of purgatives bring back the serous purging of the complaint, to the great danger and prejudice of the patient. Indeed, during the prevalence of Cholera, purgatives should be very carefully dealt with, when it is necessary to use them. They are almost always improper, when purging actually exists—as for salts and other saline purgatives, they should not be touched. In two fatal cases, which occurred in private practice, castor oil in the one case, and castor oil and salts in the other, were most improperly taken by the patients, when they felt the disease coming on them. And I may here be permitted to remark, that very many lives, indeed, might be saved, by people calling in instant advice, when affected with unusual purging, whether during night or day. I shall now, before I detail the diet during convalescence, and the general precautions proper to be put in practice by the community during the prevalence of Cholera, as well as the steps to be taken by those who are remote from medical aid, proceed to state what I have to say relative to the treatment of collapse.

I never found it of any use to bleed the patients in collapse, even so far as it is practicable to do so. The patient in most instances is cold, and requires to be heated with the warm-air bath, a simple contrivance, consisting of a few half hoops, the end ones of iron, stayed together by longitudinal braces; having a solid piece of wood at one end, pierced with a hole, through which a curved tin tube, four inches in diameter, proceeds, and which serves to transmit the heated current of air, impelled upwards by the flame of some spirits of wine, held in a tin cup, supported by a rod on which it slides. By the use of this apparatus, the patient may be well heated in from ten to twenty minutes. The same object, however, is readily effected by bladders or bottles filled with warm water—pillow-cases, containing each a few pounds of hot salt,—or hot bricks wrapped up in flannel or other cloths. The heat of the bottles may be tempered in the same manner. As soon as the process for heating is put in operation, the patient must receive a scruple of calomel, two grains of opium, and a drachm of laudanum, mixed with spirits and hot water; an injection, composed of half a pint of starch or gruel at a blood heat, and containing a drachm of laudanum, is to be given at the same time. Men and women may commonly receive these doses; but they must be lessened

for weak persons and for children, as already stated. When the patient's body is well heated, let it be carefully rubbed, using, if at hand, the following liniment, which is also proper during the cramps, viz.:

Common spirits, a pint ;
Tincture of Spanish flies, two drachms ;
Camphor, two drachms ;
Strong vinegar, or water of ammonia, an ounce.
Spirits of turpentine, two ounces. Mix.

I do not, however, place very much confidence in hand-rubbing, and still less in the liniment in question: the medicines are matters of much more importance; but, if there be plenty of help, it is as well not to omit either. Let mouthfuls of mulled wine, negus, white-wine whey, or good punch, be given at intervals, during the collapse. If, after four hours, the pulse and heat have not returned, let ten or twenty grains of calomel, and a proportionate quantity of opium, and the opiate injection, be repeated; and every four hours afterwards, five grains of calomel and a grain of opium, so long as life remains, or till the patient recovers. If, however, the extremities continue cold and blue, and the nose, tongue, and chin keep cold likewise—if the patient tries to keep his hands constantly out of the clothes, and falls into a dull, nearly insensible state, from which it is difficult to rouse him, little hopes can be entertained of his recovery. But, as I have said before, we should never relax using all our efforts while life remains. In fatal collapse, the system continues insensible to the action of the strongest stimuli, in whatever quantities—it seems to make no difference whether they are given or not. The young and comparatively vigorous, are, in general, most apt to recover from collapse. In the Belfast Hospital, there have been nearly thirty recoveries from this stage. Collapse will sometimes set in before the pulse is extinguished; indeed, with the better classes, the pulse will often continue to the last, in a very subdued state, however. We must be as careful not to overdose as to underdose; but the preceding directions are, I think, sufficiently explicit on this point: they contain the substance of my own practice; and in no instance have I had reason to suppose that I had exceeded on this point, although the contrary was at first the case. If the patient recovers from collapse, the pulse will begin to beat freely—a natural heat will return to the surface—the eye will grow bright—the patient will become cheerful, and talk—the natural dejections will be resumed—a warm perspiration will flow over the surface, and there will be a craving for food. The constitution, however, will sometimes rally for a moment—the pulse will return; but in a short time, the awakened powers die away, in spite of every effort, and the prostration become complete. Even when the hopes of a perfect recovery may be safely indulged in, constant caution must never cease for a moment; I have seen apparently slight imprudence in exposure, diet, or exertion, bring on a relapse more than once, ending in two instances fatally. But the best way to manage with regard to collapse, is to prevent any one from falling into it; and I have the best reasons for knowing that the treatment already laid down, will, in almost every case, not only prevent collapse, but certainly cure the disease, when taken in an early stage. The exceptions have already been pointed out, but early treatment affords the best chance; and I have seen many cases wherein nothing but the earliest and most energetic treatment could have saved the patient's life.

Now, I shall say a word on the mode of action of the remedies which I have enlarged on so panegyrically. First, as to heat, every one knows, that, without a certain degree of heat, we must surely die; the absence of this alone, then, would prove the certain cause of death in Cholera. No other reason need be urged for employing it. The blood-letting acts as an indirect, but powerful stimulus. If asked how, I answer, by lessening the burthen of the heart's action, and diminishing the internal congestion, thereby permitting a freer circulation, and consequently, a better discharge of the functions of life, already much impeded; for the blood, turned away from the surface, crushes, as it were, as the sufferers rightly express it, the heart and internal viscera, and adds to the actual loss of nervous power, along with the clamminess of the blood, in preventing the heart from executing its functions. When drawn, I have sometimes seen the blood exhibit more the consistence of porridge than that which naturally belonged to it. Without the due circulation of the blood, life must cease; for the functions which constitute it cannot be discharged: by restoring the circulation, these functions are resumed, and should not the agent which performs this be called a stimulus? False or contracted views of the physiology of our frame, would assert, that the operation of blood-letting is always a debilitating one; but this is not true; for in Cholera it is directly the reverse. In many states of the animal economy, indeed, it is a process highly productive of debility; but Cholera is one of the diseases in which it is not only not so, but in which it proves a most powerful stimulant. Patients will be brought in with a heavy labouring pulse, great uneasiness in the head, chest, but especially in the heart, which they sum up in the one word, *crushing*. They throw off the clothes; they toss their arms from side to side; they sigh deeply and gasp for breath, and sometimes say their breast feels as if bound with cords. Bleed them largely, and all these distressing symptoms flow away with the blood. The crushing is gone—they breathe freely, and the eye loses its heaviness—in a word, blood-letting proves an admirable remedy, in addition to our other means of treating Cholera in the early stages. Plethoric patients, having felt the relief arising from blood-letting, have intreated that it should be repeated, as the crushing was not quite gone. By blood-letting, the consecutive fever is almost wholly averted—so much so, as to be a mere incidental feature of the complaint; it hinders congestion in any of the viscera, which would lay the foundations for after complaints, and prevents the effusion of blood on the brain and spinal marrow, which is the cause of death in many who would otherwise have recovered from collapse. A powerful man, a sailor, was brought to the hospital a few days since; he was taken ill at sea; the master gave him pepper and brandy, which prolonged his life long enough to permit effusion of blood upon the spinal marrow, under the effects of which he laboured when brought in. Upon opening the spine after death, to see if my conclusion was correct, I found the sheath of the spinal marrow absolutely gorged with blood during its whole course, precluding all chance of the poor man's recovery. This instance illustrates one of the grounds upon which I urge the utility of blood-letting. There was no reason in the nature of things, why this man should have died, save in the absence of proper care. Nature, indeed, is good and bountiful; she furnishes us with abundance of means, but leaves them under our own controul.

The calomel and opium prove powerful stimuli; they stop the purging and vomiting, sometimes in a single dose, in the quantities pointed out. The one enhances the action of the other—they instantly act upon the whole nervous system in proportion to its vitality, but upon the sympathetic system in particular. The consequence of this is, that the last resumes its functions; the excretories of the intestines close their dilated orifices, and secrete healthy mucus; the debilitating drain ceases to be poured out; the kidneys secrete their urine, the liver its bile, and the pancreas its peculiar fluid; the heart receives a fresh increase of vital energy, and beats light and free—in fine, the powers of life are restored. The alcoholic drinks, wine, brandy, whiskey, and the rest, act as additional and powerful stimuli; for it is a law of the animal economy, that when one stimulus has been urged so far as propriety permits, another and another may be safely added in different directions, increasing thereby the sum total of their influence. Some discrimination, however, is necessary to know when this is proper, and when it is not; but it is indubitable, that alcoholic drinks, when used with discretion, are highly useful in Cholera.

The diet, during convalescence from Cholera, must be of a light, nourishing nature; by degrees, the patient will be able to digest strong food. At first, a little arrow root, rice milk, panada, or bread sopped in tea, weak soups and bread, will be best; after a few days, the patient will be able to take a little meat. The strength must be kept up with moderate portions of wine and water. Some patients will recover their strength almost immediately; others will be days, and even weeks, in getting round. In general, however, when the disease is early and properly treated, and the subject of ordinary strength, the recovery is very prompt. If secondary fever should supervene, which is more frequently the case after collapse, the treatment is the same as that followed in ordinary fevers, the principal indication in general being to keep up the strength with wine and other stimuli. As I have said, the secondary fever is averted by early bleeding.

Should individuals be placed in circumstances where they have not the advantage of immediate medical aid, as at sea, or otherwise, and are desirous of knowing how to treat Cholera, should it attack them, I have only to advise them to follow the preceding directions as closely as possible. Let them endeavour to keep up their spirits by the reflection, that the mode of treatment is not difficult to conduct, and that, by employing it early themselves, they will recover with greater certainty than by tardy medical aid. Common sense, with a little energy and presence of mind, are all that are necessary; panic fears, or abject cowardice, are not only unworthy of reflecting men, but actually disqualify us from using the means within our reach. The only error which they can well fall into, is that of mistaking the disease;—but, if affected with looseness in the bowels, there can be no harm in taking thirty or forty drops of laudanum, in a little brandy, or peppermint and water. If the purging continue, or be followed or accompanied with vomiting and cramps, let no time be lost in putting the directions already given, into practice. There is no danger in giving the remedies in accidental purging and vomiting; but, should these be symptoms of Cholera, their exhibition will preserve life. No captain of a ship should proceed from a port where Cholera exists, without

having a store of calomel and opium, good brandy, and some person who could bleed on board. Had such precautions been attended to, the unfortunate ships, "Brutus" and "Transit," not to mention others, would not have incurred their fate. In country villages or districts, where medical aid is deficient, the proper medicines might be entrusted into the hands of the most intelligent and active inhabitants.

Many people are anxious as to what they should eat and what they should drink, during the prevalence of Cholera. The grand caution is to avoid excess; in other respects, the use of sound meat, fish, vegetables, fruit, wine, spirits, or other food, in due moderation, and at the ordinary intervals, cannot prove injurious. If people will commit excesses in any of these articles, they should also calculate the possible results. Those who commit habitual excesses will do well to avoid them, but they also should reflect, that the ordinary consequences of these cannot be remedied in a day. Every one, however, should be cheerfully prepared to meet all possible contingencies. Death, in the long run, is no evil—it is our final and necessary lot—let us take all rational means to avoid it; but if it must come, whether by Cholera or otherwise, let us calmly resign ourselves into the hands of that Providence, which is ever kind and watchful, both here and hereafter.

THE END.